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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,785	07/30/2003	Yuji Harada	0171-0996P	9402
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BIRCH STEWART KOLASCH & BIRCH			HU, HENRY S	
PO BOX 747			ART UNIT	
FALLS CHURCH, VA 22040-0747			PAPER NUMBER	

1713

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,785

Applicant(s)

HARADA ET AL.

Examiner

Henry S. Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE of June 27, 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 3 and 5-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,11 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-12 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to **RCE request** filed on June 27, 2005 and the **Amendment after Final** filed on April 25, 2005. Claims 4-10 were amended, and new Claims 11-12 were added. To be more specific, the fluorinated polymer of parent Claim 4 was amended to have a polydispersity index of 1 to 1.20; dependent Claims 5-10 were amended to become dependent from parent Claim 3. Newly submitted **Claims 11-12** are related to alpha-methyl-vinyl derivatives and are dependent from parent Claim 1 or dependent Claim 2, they **are thereby joined with the elected Group I (Claims 1-2 and 4)**. **Claims 1-12** are now pending, while **Claims 3 and 5-10 are withdrawn from consideration** as being directed to a non-elected invention. An Action follows.

Response to Argument

2. Applicant's argument on the request for RCE filed on June 27, 2005 and the Amendment after Final filed on April 25, 2005 have been fully considered but they are not persuasive. The focal arguments related to the patentability will be addressed as follows: In view of the Applicants' argument on pages **6-9** of Remarks in the Amendment after Final, the three 103(a) rejections as well as ODP rejection are all sustained **with the same ground of rejection**.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 4 and 12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 9-18 of copending Application No. 10/316183, now **USPG-PUB 2003/0232940 A1 to Komoriya et al. (with an earlier "priority date of 12-31-2001")** for the reasons set forth in **paragraphs 3-6 of office action dated 1-25-2005 as well as the discussion below.**

4. **Applicants:** Applicant has claimed an unexpected way of obtaining a fluorine-containing polymer from a polymerizable monomer having a **styrene-based** structure of the general formula (1) with two fluorinated alcohol-based substituents on the aromatic ring. The key point is that such a polymer has a polydispersity index of 1 to 1.20. Komoriya does not teach such an index number, and it would take special effort with controlled polymerization conditions to reach such an index. Therefore, **the polymers are different.**

5. **Examiner:** The Examiner fully realizes that the difference in polydispersity index (Mw/Mn) is mainly from different type of polymerization used. In a very close examination,

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Komoriya has already disclosed in his specification that various polymerizations may be used. It may cover most of polymerization types known in the art since free radical induced polymerization, ionic polymerization, coordinated anionic polymerization and living anionic polymerization have been disclosed by Komoriya. Therefore, Komoriya may have already obtained such an index (page "27", line 13-18; attention: Komoriya has 44 pages for specification). Additionally, parent Claim 1 of present application does not include any polymerization condition(s) in order to reach such a claimed index. The Examiner would not and cannot read specification into claim in this regard.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. *The limitation of parent Claim 1 of the present invention relates to a fluorinated polymer obtained by living anion polymerization of a monomer having a styrene-based structure of the general formula (1), wherein R¹ and R² each are an acid labile group and R³ is hydrogen or methyl, and having a polydispersity index of 1 to 1.20. Other parent Claim 4 relates to the fluoropolymer containing monomeric unit of Claim 1. See other limitations of dependent Claims 2 and 11-12.*

8. Claims 1-2, 4 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen et al. (USPG-Pub 2002/0164538 A1) or Hashimoto et al. (USPG-Pub 2002/0155376 A1), each individually in view of Sprague et al. (Journal of Fluorine Chemistry, Vol. 52, pp. 301-306, (1991)) for the reasons set forth in **paragraphs 9-15 of office action dated 1-25-2005 as well as the discussion below.**

9. Claims 1-2, 4 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Middleton (US 3,179,640) in view of Sprague et al. (Journal of Fluorine Chemistry, Vol. 52, pp. 301-306, (1991) and either Allen et al. (USPG-Pub 2002/0164538 A1) or Hashimoto et al. (USPG-Pub 2002/0155376 A1) for the reasons set forth in **paragraphs 9-15 of office action dated 1-25-2005 as well as the discussion below.**

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10. **Applicants:** Applicant has claimed an unexpected way of obtaining a fluorine-containing polymer from a polymerizable monomer having a styrene-based structure of the general formula (1) with two fluorinated alcohol-based substituents on the aromatic ring. The key point is that such a polymer has a polydispersity index of 1 to 1.20. The Applicants allege that the involving references, in combination or alone, would not teach or fairly suggest such a fluorinated polymer with such an index in such a range (see page 8 of Remarks).

The Applicants further allege that the claimed polymer would have a higher glass transition temperature as compared with a polymer having an index more than 1.20. Such a higher Tg would **render excellent and non-obvious effect on increasing prebake temperature and PEB temperature, resulting in easy control of the acid diffusion property and deblocking reactivity** (see page 9 of Remarks).

The Applicants further allege that the addition of new Claims 11 and 12 may be distinguished over the prior art since they are alpha-methyl-styrene monomers.

11. **Examiner:** As discussed in the earlier office action for **Claims 1 and 2**, each of Middleton, Allen and Hashimoto has disclosed the moiety of the claimed monomer but is **silent about adding an additional substituent of hydroxyfluoroalkyl group on styrene** (Claim 1) and particularly forming a symmetrical structure of meta-symmetry (for Claim 2). As discussed earlier, Sprague does teach a concept of providing an additional hydroxyfluoro-alkyl-based substituent onto the styrene in order to gain **more functionalities** with advantage being well

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known in the art; Sprague has also suggested implicitly the use of $-\text{CH}=\text{CH}_2$ as monomeric moiety since his final styrene is unfavorable for polymerization due to the presence of $-\text{CF}=\text{CF}_2$. It is noted that $-\text{CH}=\text{CH}_2$ and $-\text{CF}=\text{CF}_2$ are both well known as polymerizable monomeric units in the art.

12. Therefore, one having ordinary skill in the art would have found it obvious to modify Allen or Hashimoto's acid-labile protected mono-hydroxyfluoro-alkyl-substituted styrene by **adding an additional the same substituent on styrene and thereby forming a structure of meta-symmetry** as taught by Sparague with two advantages. One advantage is the addition of such an additional group on styrene will allow additional property enhancement due to fluorine content; the other advantage is that it will allow an additional functional group for modification use and increase crosslinking for improved property performance. Thereby a better polymeric product can be obtained.

Therefore, one having ordinary skill in the art would have also found it obvious to modify Middleton's mono-hydroxyfluoroalkyl-substituted styrene by **adding an additional substituent of hydroxyfluoroalkyl group on styrene and forming a structure of meta-symmetry** as taught by Sparague as well as **further attaching acid labile groups on the alcoholic oxygen** as taught by Allen or Hashimoto with a total of three advantages. The first advantage is the addition of such an additional hydroxyfluoroalkyl group on styrene will allow additional property enhancement due to an increase on fluorine content; the second advantage is that it will allow an additional functional group for modification use and increase crosslinking

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for improved property performance. The third advantage is such obtained polymers having acid-protected groups are useful in lithographic photoresist compositions especially when it is combined with photoacid generator. Thereby a better polymeric product can be obtained.

13. The Examiner fully realizes that the difference in polydispersity index (M_w/M_n) is mainly from using different type of polymerization as the Applicants have pointed out. In a very close examination, "the preparation of monomer is for the purpose of making polymers" has been commonly known in the art as well as has been demonstrated in all involving references. In this regard, various types of polymerization may be used by ordinary skill in the art and such a claimed polymer may be therefore obtained among many obtained polymers after a full effort in organic synthetic research is done. Although the Applicants have presented excellent and (maybe) unexpected results from a higher T_g resulted from the claimed polydispersity index in such a range, **a combination of controlled polymerization condition(s), a higher T_g , an increasing prebake temperature and/or PEB temperature are not included in parent Claim 1 at all.** Since the Examiner would not and cannot read specification into claim in this regard, the Applicants may consider doing so in order to be possibly distinguished from the prior art.

With respect to addition of **new Claims 11 and 12**, they are not distinguished over the prior art even they are alpha-methyl-styrene monomers. The key point is that such a monomeric moiety is commonly known in the art. Additionally, they are derivatives or isomers from styrene.

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14. Claim 1-2, 4 and 11-12 are provisionally rejected under 35 U.S.C. 103(a) as being obvious over copending Application No. **10/316183**, now **USPG-PUB 2003/0232940 A1** to **Komoriya et al.** (with priority date 12-31-2001) for the reasons set forth in **paragraphs 9-15 of office action dated 1-25-2005 as well as the discussion below and the ODP discussion above** (paragraphs 3-5).

15. **Applicants:** In order to overcome Komoriya as a potential prior art for 102(e) rejection, a verified English translation of JP 2002-222955 (filing date of July 21, 2002) has been submitted.

16. **Examiner:** According to the record in USPTO, Komoriya "940" carries a foreign priority date for JP 2001-380776 at December 31, 2001. Therefore, the 103(a) rejection can be overcome by the priority date in this regard.

Conclusion

17. With respect to **Claims 1-2, 4 and 11-12**, all directly relate to the pre-amended Claims 1-2 and 4, they still carry the same scope of original limitations. Therefore, the same rationale recited in the final rejection of previous Claims 1-2 and 4 can be applied.

18. This is a **RCE of applicant's earlier Application No. 10/629,785**. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on

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the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

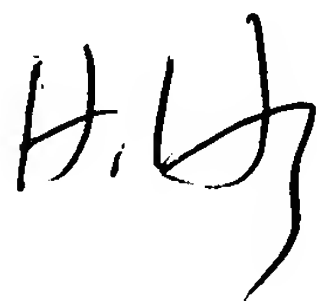
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Dr. Henry S. Hu whose telephone number is (571) 272-1103. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, art unit 1713, USPTO

August 31, 2005



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